Uganda Electricity Transmission Company
Limited

Bujagali Interconnection Project
Executive Summary

Prepared by
R.J. Burnside International Limited
292 Speedvale Avenue West, Unit 7 Guelph ON N1H 1C4 Canada

In association with
Dillon Consulting Limited, Canada
Ecological Writings #1, Inc., Canada
Enviro and Industrial Consult (U) Ltd., Uganda
Frederic Giovannetti, Consultant, France
Tonkin & Taylor International Ltd., New Zealand

December, 2006

File No: I-A 10045

The material in this report reflects best judgement in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. R.J. Burnside International Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.
# Table of Contents

Glossary ........................................................................................................................................... iii  
Foreword ........................................................................................................................................... v  
1.0 Introduction ................................................................................................................................. 1  
1.1 Project Overview and History .................................................................................................. 1  
1.2 SEA Process and Report ........................................................................................................... 5  
2.0 Regulatory Requirements .......................................................................................................... 7  
3.0 Project Setting .......................................................................................................................... 9  
3.1 Project Setting ....................................................................................................................... 9  
3.2 Biophysical Conditions ........................................................................................................... 9  
3.3 Socio-economic and Cultural Conditions .............................................................................. 11  
4.0 Project Alternatives .................................................................................................................. 14  
4.1 Existing Electricity System and Need for the Bujagali Interconnection Project .................. 14  
4.2 Description of Interconnection Options ................................................................................... 14  
4.3 Detailed Route Selection and Optimisation ............................................................................ 16  
4.4 Substation Site and Optimization ............................................................................................ 22  
5.0 Project Description .................................................................................................................... 26  
6.0 Public Consultation and Disclosure ......................................................................................... 32  
6.1 Consultation Program ............................................................................................................ 32  
6.2 Grievance Management Mechanisms ..................................................................................... 38  
6.3 Disclosure Program .................................................................................................................. 39  
7.0 Impact Identification, Management and Monitoring ............................................................... 40  
7.1 Compliance Screening ............................................................................................................. 40  
7.2 Developmental and Community Benefits ............................................................................... 40  
7.3 Key Project Issues and Net Effects Analysis ........................................................................... 41  
8.0 Social and Environmental Action Plan .................................................................................... 48  
8.1 Environmental Management ................................................................................................... 48  
8.2 Relationship of the SEAP to other Project Plans .................................................................... 49  
8.3 Implementation of the Social and Environmental Action Plan ........................................... 49  
8.3.1 EPC Contractor’s Commitments and Resourcing ............................................................ 49  
8.3.2 Reporting Lines and Decision-Making ................................................................................ 52  
8.3.3 Social and Environmental Auditing and Reporting .......................................................... 52  
8.3.4 Change Management .......................................................................................................... 53  
8.4 Responsibilities for Social and Environmental Mitigation Measures ................................... 53  
8.5 Responsibilities for Environmental Monitoring Measures .................................................. 54
Glossary

AESNP  AES Nile Power
AIDB  African Development Bank
AOI  Area of Influence
APRAP  Assessment of Past Resettlement Action Plan
BEL  Bujagali Energy Limited
BIU  Bujagali Implementation Unit
CBO  Community Based Organisations
CDAP  Community Development Action Plan
CFR  Central Forest Reserve
DEG  Deutsche Investitionen und Entwicklungsgesellschaft mbH
DRC  Democratic Republic of Congo
EA  Environmental Assessment
EIB  European Investment Bank
EIA  Environmental Impact Assessment
EMMP  Environmental Mitigation and Monitoring Plan
EPC  Engineer, Procure, Construct
ES  Executive Summary
EU  European Union
FSL  Full Supply Level
GoU  Government of Uganda
HPP  Hydropower Project
IBRD  International Bank of Reconstruction and Development
ICSID  International Centre for Settlement of Investment Disputes
IDA  International Development Association
IESA  Integrated Environmental and Social Assessment Guidelines
IFC  International Finance Corporation
ILO  International Labour Organisation
IP  Interconnection Project
IUCN  International Union for the Conservation of Nature
km  Kilometres
kV  KiloVolts
LVBC  Lake Victoria Basic Commission
LVDP  Lake Victoria Development Programme
m AMSL  Metres Above Mean Sea Level
MDE  Maximum Design Earthquake
MFL  Maximum Flood Level
MIGA  Multilateral Investment Guarantee Agency
MoH  Ministry of Health
MOL  Minimum Operating Level Environmental Mitigation Plan
MRF  Minimum Residual Flow
MW  Megawatt
NBI  Nile Basin Initiative
NEMA  National Environment Management Authority
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
</tr>
<tr>
<td>Nile COM</td>
<td>Council of Ministries</td>
</tr>
<tr>
<td>Nile SEC</td>
<td>Nile Secretariat</td>
</tr>
<tr>
<td>Nile TAC</td>
<td>Technical Advisory Committee</td>
</tr>
<tr>
<td>OED</td>
<td>Operations Evaluation Department</td>
</tr>
<tr>
<td>OPs</td>
<td>Operational Policies</td>
</tr>
<tr>
<td>PCDP</td>
<td>Public Consultation and Disclosure Plan</td>
</tr>
<tr>
<td>PPAH</td>
<td>Pollution Prevention and Abatement Handbook</td>
</tr>
<tr>
<td>SEA</td>
<td>Social and Environmental Assessment</td>
</tr>
<tr>
<td>SEAP</td>
<td>Social and Environmental Action Plan</td>
</tr>
<tr>
<td>SEO</td>
<td>Site Environmental Officer</td>
</tr>
<tr>
<td>SIA</td>
<td>Strategic Impact Assessment Guidelines</td>
</tr>
<tr>
<td>SSEA</td>
<td>Strategic/Sectoral, Social and Environmental Assessment</td>
</tr>
<tr>
<td>TASO</td>
<td>The Aids Support Organisation</td>
</tr>
<tr>
<td>TBD</td>
<td>To Be Decided</td>
</tr>
<tr>
<td>UETCL</td>
<td>Uganda Electricity and Transmission Company Limited</td>
</tr>
<tr>
<td>WBG</td>
<td>World Bank Group</td>
</tr>
</tbody>
</table>
Foreword

The Bujagali Interconnection Project is a proposed high voltage electrical power transmission system that will interconnect Bujagali Hydropower Project to the national electrical grid. The project sponsor is the Uganda Electricity Transmission Company Ltd (UETCL).

The Project is closely associated with Bujagali Energy Limited’s (BEL) Bujagali Hydropower Project (HPP), which is a proposed 250 MW hydropower facility on the Victoria Nile.

This is the Executive Summary of the Social and Environmental Assessment (SEA) for the Bujagali IP that is being disclosed by BEL on behalf of UETCL. This document provides a non-technical synopsis of the environmental and social assessment documentation for the project.

Readers are advised to consult the SEA itself for detailed technical information, including references and sources, supporting the summary conclusions included in this non-technical synopsis.

That technical documentation is presented in two volumes:

- The Social and Environmental Assessment (SEA) Report; and,
- The Appendices to the SEA.

UETCL has begun an integrated Social and Environmental Action Plan (SEAP) that will be updated and maintained throughout the life of the project. UETCL will be consulting upon and providing regular updates to its integrated SEAP going forward. The Social and Environmental Action Plan will be a ‘living’ document that is revised regularly as project development proceeds.

The SEAP is designed to define the specific responsibilities of UETCL, its contractors and sub-contractors, as well as any third parties, where applicable, to the efficient and responsible management of social and environmental activities associated with the project. It will form one basis for UETCL’s covenants with its lenders as well as provide a vehicle to demonstrate its compliance with regulatory requirements.

As updates are prepared, the SEAP will be consulted upon regularly with affected stakeholders. Progress on the contents and implementation of the SEAP will be publicly reported upon, as well, at regular intervals on a go-forward basis.
1.0 Introduction

1.1 Project Overview and History

The Bujagali Interconnection Project ("the Project" or IP) is a proposed high voltage transmission system designed to connect the proposed Bujagali Hydropower Project (HPP) to the national grid (Figure ES-1). The project sponsor is the Uganda Electricity Transmission Company Ltd (UETCL), a public limited company 100% owned by the Government of Uganda (GoU).

The IP, shown will involve the construction and operation of:

- A 132kV switchyard on the west bank of the Victoria Nile adjacent to the hydropower facility (previously approved by NEMA in its 220/132 kV configuration as part of the Hydropower EIS, Atkins 1999);
- A 132 kV line south from the Bujagali switchyard to the existing 132 kV line from Nalubaale to Tororo (length – 4.5 km), where that line will be severed;
- A second 132 kV line extending north from the severed Nalubaale-Tororo line to interconnect with the Bujagali switchyard (length – 5.0 km);
- A new 220 kV capacity transmission line operating at 132 kV from the Bujagali switchyard to a new substation at Kawanda, north of Kampala (length 70.5 km);
- A new substation at Kawanda; and,
- A new 132 kV line from the Kawanda substation to the existing 132 kV substation at Mutundwe in southern Kampala (length – 17.5 km). Internal improvements (i.e. new bay and switching gear) at Mutundwe to accommodate this new 132 kV line will also be required.

Development of the HPP was initiated by AES Nile Power Ltd., ("AESNP") in the late 1990’s. At that time the IP was bundled together with the HPP as one project. The Social and Environmental Assessment (SEA) documentation prepared by AESNP for the integrated project was approved by the Government of Uganda’s (GoU) National Environmental Management Authority ("NEMA") in 1999/2001 and by the World Bank, IFC and African Development Bank Boards in December 2001.

In 2003 AESNP withdrew, leading the GoU to assign the IP to UETCL, and initiate an international bidding process for the HPP project. In 2005 Bujagali Energy Limited (BEL) was selected as the preferred bidder and entered into a power purchase agreement and an implementation agreement with the GoU. BEL expects to complete financing and start construction in 2007. On that timeline, construction would be completed with first power flowing into the National Grid in 2010.

BEL is a project-specific partnership of SG Bujagali Holdings Ltd. (a wholly owned affiliate of Sithe Global Power, LLC) and IPS Limited (Kenya). UETCL has
This page is left intentionally blank.
contracted BEL to assist with project planning and to coordinate the preparation of the SEA Documentation.

1.2 SEA Process and Report

The Social and Environmental Assessment (SEA) was completed in compliance with the requirements of the GoU and the policies and guidelines of the African Development Bank, the main International Financial Institution (IFI) that is expected to finance the project. The purpose of the SEA is to ensure that the project is designed and developed in a manner that minimizes negative social and environmental effects while maximizing project benefits. The SEA Report describes the results of the SEA process. The SEA Report is being made available to stakeholders for their review.

UETCL conducted the SEA according to Terms of Reference (ToRs) that were approved by GoU (NEMA) and were made available to IFI representatives, project affected people, NGOs and the general public for their review.

The main SEA work for the IP commenced in early 2006 including ecological fieldwork, social surveys and consultations with relevant review agencies and potentially affected people and NGOs. Consultations on the draft findings of the SEA were carried out in September and October of 2006. Consultations with stakeholders, including on this draft SEA, are an ongoing feature of UETCL’s SEA process.

The main sections of the SEA Report, which are summarized in the balance of this executive summary, describe and document:

- The applicable regulatory requirements;
- The existing social and environmental conditions in the study area;
- The need for the project and the alternatives that were analysed;
- The design of the proposed facility, as well as the plans for its construction, operation, and maintenance;
- The consultation program including describing the project responses to issues identified during public consultation activities;
- The potential social and environment effects of the project, along with the proposed mitigation and monitoring measures; and,
This page is left intentionally blank.
2.0 Regulatory Requirements

UETCL is planning the IP, and this SEA Report has been prepared, to be in compliance with the regulations and standards of the GoU, and the safeguard policies and guidelines of the AfDB. It also recognises that the project is considered by the IFIs involved in the HPP to be an associated facility to the HPP.

The GoU agency with primary responsibility for impact assessment of projects in Uganda is the National Environmental Review Agency (NEMA). NEMA was created under the National Environmental Management Act and mandated with the responsibility to oversee, coordinate and supervise environmental management in Uganda.

The Third schedule of the National Environmental Management Act specifies that any development that involves dams, rivers and water resources (including storage dams, barrages and weirs) or electrical infrastructure (including electricity generation stations, electrical transmission lines and electrical substations) require an Environmental Impact Assessment. An assessment of potential environmental and social effects is also a key policy requirement for all the IFIs involved in the project. For the purposes of this Project the term Social and Environmental Assessment, or SEA, is considered to be synonymous with the different terms used by NEMA and the various lenders for social and environmental assessment documentation.

A concordance analysis has been completed to show how the standards, guidelines and policy requirements of the GoU and the IFIs applicable to the project have been identified, including requirements for:

- Social and environmental safeguard policies, performance standards and guidelines;
- Ongoing stakeholder consultation and engagement;
- Ongoing public disclosure of relevant information;
- Land acquisition and compensation and resettlement planning; and,
- Mitigation, monitoring and follow up of social and environmental effects; and,
- Social and Environmental Action Plan updating, consultation and disclosure throughout the life of the project.

Where such requirements overlap, as for example is the case for wastewater discharge where the GoU has effluent quality regulations and the WB has effluent quality guidelines, than the more stringent of the overlapping requirement has been adopted as the project applicable requirement. A complete listing of the social and environmental requirements applicable to the project is provided in the SEA.
This page is left intentionally blank.
3.0 Project Setting

3.1 Project Setting

The Lake Victoria basin, in which the IP is located, is predominantly lowland, interspersed with remnants of upland surface typical of a landscape still undergoing erosion. The region is characterised by a pattern of low but often steep hills, which are generally highest towards the south, closer to Lake Victoria.

Jinja town, located on the east side of the river near Nalubaale is the closest large community to the eastern end of the IP. The city developed starting in the 50’s when power for industry became available from the Owen Falls project. Kampala, Uganda’s largest city is located about 70 km to the west.

The majority of the study area for the IP is rural, with estate and small-scale or subsistence agriculture being the predominant land uses. Agricultural activity is primarily a labour-intensive, intercropping system with both cash and subsistence crops following the seasonal changes. The main cash crops are coffee and sugar cane, coupled with more recent cropping of vanilla. Subsistence food crops include bananas, cassava, sweet potatoes, maize, beans, millet, and yams. Where the transmission system approaches Kampala the landscape becomes increasingly populated.

The hilly landform determines the drainage pattern for the region. Only short local streams and the lakeside marshes discharge into Lake Victoria, with all larger watercourses, including the valley marshland around the northern side of Kampala, flowing generally northwards towards Lake Kyoga or the Lugogo River. Mabira Central Forest Reserve (CFR) occupies a large portion (about 17 of 70 km) of the transmission system wayleave area between Kampala and Jinja, providing a distinctive and enclosed contrast to the more highly populated farmland of its surroundings. There are many large estates, usually tea or sugar plantations, around the periphery of Mabira CFR and to the south, which provide an open, rolling landscape with distant views.

3.2 Biophysical Conditions

The landscape along the proposed transmission line can be divided into eight areas of relatively distinct landforms, land use and vegetation patterns moving from west to east including Natete; Lubigi; Kawanda; Northern Kampala Farmland; Sezibwa Farmland; Mabira Fringes; Mabira Forest and Eastern Farmland.

There are two main hydrological features on the proposed transmission line route: the River Nile to the east, and the Lubigi swamp to the west. To the north of Kampala, in the area of Kawanda, the transmission line will cross a number of poorly drained areas with resulting seasonal swamps. The Lubigi swamp, which lies approximately...
8 km west of central Kampala, is a large permanent wetland area. In addition to the above features, the transmission line will traverse smaller watercourses that generally drain from south to north.

Lake Victoria, the Mabira CFR and Lake Kyoga influence rainfall. The rainfall pattern is distinctly bimodal, with peaks occurring in March-May and again in September-November. Mean annual temperatures recorded throughout Mukono District range from 23.5°C to 24.1°C. Mean maximum temperatures recorded range from 25.1°C in July to 27.5°C in January, while the minimum mean recorded temperatures range from 14.2°C in August to 16.0°C in April. The local meteorology is characterised by a very high frequency of southerly winds. Prevailing southerly winds occur for over 30 percent of the year. Winds from the west-northwest to the east are very infrequent.

The proposed transmission line will traverse four ecologically significant areas: Mabira CFR, two smaller CFRs, Kifu CFR and Namyoya CFR (the latter also known as Mwola) and Lubigi Swamp. Plant, bird and mammal surveys were carried out in the Mabira, Kifu and Namyoya CFRs during January 1999 and November 2000 and again in mid-2006.

Mabira CFR is the largest natural high forest reserve in the biogeographical zone of Lake Victoria Crescent and is an important source of forest products. The vegetation of Mabira Forest is classified as “medium altitude moist semi-deciduous”. The forest has been greatly influenced by human activities, including timber harvesting, cultivation and grazing, and is regarded as secondary forest resulting from, and constantly being influenced by, human activities. In the Forestry Nature Conservation Master Plan, Mabira CFR is designated a CORE conservation forest in recognition of its biodiversity importance and a forest management plan (FMP) for Mabira CFR has been developed, and covers the period 1997 to 2007. An important new development is the imminent opening of a luxury ‘eco-friendly’ lodge project located deep within the Mabira CFR some 25 km from Jinja.

Namyoya CFR was established in the 1960s as a Natural Forest Reserve. Prior to 1996, the reserve was managed for production and environmental benefits. However, the reserve is located in a densely settled area and was severely degraded due to encroachment. Of the three CFRs situated along the existing transmission route, Namyoya CFR has the lowest proportion of forest bird species, an indication that the forest cover is either very scattered or is composed of a limited variety of species.

Kifu CFR to the south of the existing transmission line is in a secondary growth state with thick undergrowth. The sections of the forest to the North of the transmission line are currently plantation forests; the same is the case in Namyoya CFR.
The Lubigi Swamp is the only permanent wetland area within the proposed transmission system. It is situated to the west of Kampala and north of the Mutundwe substation. It is considered to represent a typical papyrus swamp vegetation type found throughout Uganda. Although Lubigi Swamp is situated within 15 km of Lake Victoria, it forms the headwaters of a continuous flooded valley system that eventually drains into Lake Kyoga. Despite its closeness to Kampala, and levels of human disturbance, the Lubigi swamp still supports notable numbers of birds and mammals:

3.3 Socio-economic and Cultural Conditions

There is widespread poverty in Uganda, and the country is consistently ranked one of the poorest nations in the world. Approximately 85 percent of the population in Uganda reside in rural areas and depend mainly on agriculture for their livelihood. Literacy rates are low.

Agricultural activity is primarily a labour-intensive, intercropping system with both cash and subsistence crops following the seasonal changes. The main cash crops are coffee and sugar cane, coupled with more recent cropping of vanilla. Subsistence food crops include bananas, cassava, sweet potatoes, maize, beans, millet, and yams.

The City of Kampala is Uganda’s political and commercial centre. The Town of Jinja, Uganda’s second largest urban centre, serves as the administrative centre for Jinja District and is the District’s prime economic hub, housing industries such as textiles, beer, plastics, food processing, and flour milling.

Within the project area, there are several ethnic groups, mostly of Bantu origins. Historically, the Basoga people inhabited the areas of southern Uganda east of the Nile and the Baganda inhabited the areas west of the Nile. This is still largely the case, although people of both tribal backgrounds live on both banks of the river today. Although the Busoga and Buganda languages vary, they are similar to one another and mutually understandable. Many people still practice traditional religions, although they are often practised in concert with Christianity and Islam. Several people have amasabo (roughly translated as shrines) on their properties where they can pay respect to their ancestors and commune with spirits.

From the social surveys that were undertaken as part of the IP RAP, 46 percent of the people affected by the proposed transmission line depend on agriculture as their primary source of income, with the majority of the remaining people deriving some income from farming. The majority of the affected household heads are tenants, while the remainder are licensees and landowners. The major occupations reported by the affected persons include: merchants, students, professionals, low-income entrepreneurs, drivers, civil servants, teacher/researchers, retired persons, house help, and, others. Thirty-five percent of all affected household heads are women. The average affected household size is 4.9 individuals. Thirty seven percent of
households within the study area are Protestant, 36 percent are Catholic, 23 percent are Muslim and 4 percent practice other beliefs.

The proposed transmission system corridor passes through Mukono, Wakiso and Kampala Districts. Districts are further divided into counties, sub-counties, parishes and villages.

Comparing the two rural districts within the study area, the population density is generally lower in Mukono than in Wakiso, particularly in the central part of the District. This is primarily due to the presence of the Mabira Forest and a number of large agricultural plantations. Within the part of Kampala District relevant to the proposed Bujagali interconnection system, densities are fairly consistent and are about twelve times those of Wakiso District and thirty times those of Mukono District.

Within Kampala District the predominant land use proposed is residential, although the swampy areas on the western fringes of the city are designated ‘environmental areas’ where the policy is the protection and preservation of open space.

A number of all-weather roads run in a roughly north-south direction and will be crossed by the proposed transmission line. As with all the main roads in this area, a large number of local tracks branch off of them, providing access to numerous small settlements and agricultural areas.

The general landscape of the region through which the proposed transmission system passes is comprised of flat or round topped hills, valleys incised into the plateau with farmlands and occasional swamps. The area lies to the north and west of Lake Victoria, commonly referred to as the banana-coffee belt. In the eastern portion of the proposed Bujagali transmission system, the agricultural activities are characterised by small-scale coffee banana based intercropping or intermixed systems in the Victoria Nile area and large-scale sugarcane production both to the east and west of the Mabira CFR. More small-scale coffee-banana systems occur in Wakiso district. The suburbs of Kampala have small-scale backyard farms consisting mainly of subsistence food crops.

No significant cultural properties are known to occur within the proposed transmission corridor and a 2006 archaeological assessment of the Kawanda substation site confirmed the absence of archaeological artefacts.

Malaria and respiratory infections account for about half of all outpatient diagnoses in Uganda. The prevalence of HIV/AIDS is high, with HIV/AIDS-related illness accounting for over 30 percent of all hospital admissions, and increasing. In an effort to address the spread of HIV/AIDS, widespread public education campaigns have been established and condoms are readily available.
4.0 Project Alternatives

4.1 Existing Electricity System and Need for the Bujagali Interconnection Project

Historically virtually all (99 percent) of Uganda’s electricity has been generated at the Nalubaale and Kiira hydropower facilities that are located at Jinja (Energy Information Administration, 2004). Energy generated by the Nalubaale (formerly Owen Falls) and the Kiira (formerly Owen Falls Extension Project) hydropower stations, is transmitted from the substation at Nalubaale to three substations around Kampala, which is the main load centre of Uganda (Kampala North, Lugogo, and Mutundwe), and to an existing substation in Tororo.

The development of the Bujagali HPP by BEL will require new transmission infrastructure to interconnect the project to the existing power transmission system. Feasibility studies undertaken for the project (Knight Piesold and Merz and McLellan, 1998 and Siemens, 2006) have concluded that the existing national network in Uganda is insufficient to evacuate the full 250 MW generating capacity of the Bujagali HPP using the existing lines. Thus, there is a clear need for upgrades to the existing or development of new transmission infrastructure to accommodate the proposed Bujagali HPP.

4.3 Description of Interconnection Options

The AESNP alternatives analysis for the transmission facilities was completed to identify the potential key impacts of the alternative corridors considered and, from these, select a preferred alternative. This process also involved consultations with the UEB (the electricity regulator at that time). From these consultations, it was concluded that the Bujagali transmission system should use existing transmission corridors as much as possible to reduce impacts; enable future system expansion to northern Uganda; and, minimise the number of crossings of existing transmission facilities and other utilities.

The primary transmission line corridor routing alternatives connecting Bujagali to Kawanda that were considered were: a route roughly parallel to the existing 132 kV “northern” route between Nalubaale and Kampala, and one roughly parallel to the existing 132 kV “DANIDA line” corridor between Nalubaale and Lugogo substation in south-eastern Kampala.

It was concluded that the northern route was preferred as impacts on settlement and property are lower, it is shorter, and it does not require any crossing of existing transmission lines. Moreover, the capacity of the southern corridor system was considered difficult to expand as both the substation and transmission line facilities were considered to be at capacity in the current locations. From an overall system design perspective, the northern route would provide the Government Utility with
greater flexibility for future system expansion, when compared to the southern route. In its independent assessment of the transmission line routes, the Panel of Experts, in its fourth report, concluded that AESNP had selected the most appropriate transmission line route.

The AESNP preferred option was to connect the Bujagali HPP at 220 and 132 kV as follows:

- A 220/132 kV switchyard on the west bank of the Nile adjacent to the hydropower facility;
- A double circuit 220 kV line between the Bujagali Switchyard and a new substation to be located in Kawanda;
- A double circuit 132 kV line between the Kawanda substation and the existing Mutundwe substation; and,
- Double circuit 132 kV lines between Bujagali and Tororo and Bujagali and Nalubaale. These double circuit lines will be established by intersecting the existing Nalubaale–Tororo line.

As part of the ongoing planning for the IP and the HPP new interconnection analyses were completed to ensure that the project was proceeding with the optimal interconnection option (Siemens PTI, 2006). Siemens PTI conducted extensive load flow, stability and economic evaluation studies for each of the interconnection options in the short, medium and long term, as well as testing each option’s sensitivities to the uncertainties associated with the predicted load growth, the installation of new generation in Uganda, Lake Victoria hydrology and costs of fuel, among others.

Field reconnaissance and analysis of recent satellite imagery completed as part of this SEA process confirmed that there have been no major changes to environmental or social conditions in the area that would affect the overall conclusions set out above.

Building on the work completed for the AESNP project five alternatives were formulated for the interconnection of the Bujagali HPP. The preferred option (3a) includes the following components:

- Construction of Kawanda Substation;
- Construction of a 2 x 220 kV line from Bujagali to Kawanda but operated initially at 132 kV;
- Construction of a 2 x 132 kV line from Kawanda to Mutundwe;
- Construction of a 2 x 132 kV line from Bujagali to Nalubaale;
- Construction of a 1 x 132 kV line from Bujagali to Nalubaale; and,
- Construction of a 2 x 132 kV line from Bujagali to Tororo.

Medium to long term facilities include construction of a 1x132 kV line from Nalubaale to Kampala North and a 1x132 kV line from Bujagali to Nalubaale. In the
long term there would be an upgrade of operation of the Bujagali to Kawanda to 220 kV and the construction of an additional 1 x 132 kV line from Bujagali to Nalubaale.

Improved flexibility would be achieved by installing a second circuit from the outset, as proposed in Option 3a, outweigh the capital cost difference between the other options. Option 3a has comparatively the least land use affected, the primary exception being the last kilometre of the 132 kV Kawanda-Mutundwe line, where land use near the Mutundwe substation has become highly constrained. However, unlike other options, series reactors could be used with Option 3a to preclude the future need for the 132 kV Bujagali-Nalubaale. For this reason, Option 3a with series reactors (Option 3aR) is the overall preferred Option from the social standpoint. The preferred system is shown on Figure ES-2.

4.4 Detailed Route Selection and Optimisation

Option 3aR, illustrated on Figure ES-2, was selected as the preferred system plan. The land required for the plan is the same as the land that would have been required for the AESNP plan. Both plans have the same lines and substations – the only difference being that, while the Bujagali-Kawanda Line will be constructed at 220 kV, it will be operated initially at 132 kV. As the constructions standards are the same, the land area remains the same, also.

Prior to withdrawing from the project AESNP identified a specific route for the wayleaves and specific site for the Kawanda substation. Consultations with the potentially affected villages along the routes indicated that in many places villagers and PAPs know where the AESNP Line was routed, and in many cases concrete markers can still be located by affected individuals. Comments were received by some PAPs previously surveyed by AESNP that they have been waiting all these years for their compensation, and that they have not maintained their buildings that were within the wayleaves. To locate the line elsewhere would leave such affected parties with no compensation for the disruption caused as a result of the earlier routing work, and thus, legacy issues that would need to be addressed.

Where no significant changes have occurred to land use the route for the transmission lines follows the routing previously identified by AESNP. Optimization was necessary at the Kawanda Substation, to avoid effects on the neighbouring school, and between Kawanda and Mutundwe, where urban land use has intensified. An optimized route was identified that reduces resettlement, with minor additional impacts to Lubigi Swamp. Figure ES-3 shows the original AESNP route and the optimized route for the line between Kawanda and Mutundwe.
This page is left intentionally blank.
Option 3: Line constructed for 2 circuits at 220kV but only one circuit installed and updated at 132kV.

Option 3a+3aR: Double circuit line constructed at 220kV standard but operated at 132kV.

Option 3aR: Series Reactors installed at the Bujagali Switchyard
This page is left intentionally blank.
4.5 Substation Site and Optimization

Under the planned transmission system configuration for the IP, a substation will be required in the Kawanda area, 10 km north of Kampala (Figure ES-4). During the AESNP assessment three potential sites in the Kawanda area were evaluated for the location of the substation, based on social, environmental and technical criteria. The preferred site was the Maganjo site, and landowners were subsequently re-settled from the site and given compensation, in the period 2001-2003.

Review of the approach and rationale used for the AESNP assessment within the context of the current situation concluded that the original siting decision is still valid. However, potentially negative aspects of the Maganjo site, involving impacts to graves on the site as well as to the nearby Kawanda Secondary School, were resolved through optimisation of the site design and routing of lines in and out of the site. The optimised layout of the Kawanda substation is shown on Figure ES-4.
This page is left intentionally blank.
This page is left intentionally blank.
5.0 Project Description

The IP will consist of the development of new high voltage transmission lines, and a substation at Kawanda. The general location of the line and the site are shown on Figure ES-5., as illustrated on Figure ES-2. There will be a new substation developed at the HPP site area as part of that project. The proposed lines and substation to be developed as part of the IP project are:

- "Bujagali to Tororo" and "Bujagali to Nalubaale" Lines: Two new 132 kV double circuit lines will run about 5 km south from the Bujagali Substation to a junction point along the existing Nalubaale to Tororo line. The existing line will be severed with one end reconnected to the new lines so as to create a new line between Nalubaale and Bujagali and a new line between Bujagali and Tororo. Power for Tororo would now be delivered from Bujagali substation rather than the Nalubaale substation. Power could flow in either direction between the Bujagali and Nalubaale substations depending on the operational status of the generation stations.

- "Bujagali to Kawanda" Line: This new 70 km long line will be designed and constructed to 220 kV standard. Although it may be operated initially at 132 kV.

- Kawanda Substation: This station will be designed and constructed to allow operation at 220 kV, although it may initially be operated at 132 kV. The station will be sized and laid out to allow interconnection of future lines with UETCL's longer range system plans in mind.

- "Kawanda to Mutundwe" Line: a new 17 km, 132 kV double circuit line will interconnect the Kawanda substation and the existing Mutundwe Substation and thus comprise the third interconnection point for the HPP. Internal improvements (e.g., new bay and switching gear) at Mutundwe will be needed to accommodate this new line.

The transmission lines shall be designed with steel lattice towers of the type commonly used in Uganda and worldwide. The 220 kV towers will be slightly larger and spaced further apart than the 132 kV lines. The larger 220 kV line will require a 40 m wide wayleave; the 132 kV lines will require a 30 m wayleave. No permanent structures, such as houses or outbuildings, will be allowed to remain or be constructed within the wayleaves. Farming of crops will be permitted, but limited to a height of 1.8 m or less – thus most annual crops and low growing perennial crops such as tea would be permitted.

Construction will take approximately two to three years, although except for Kawanda Substation the activities at any one spot would be of shorter duration. The main construction steps for the transmission lines would involve:
This page is left intentionally blank.
This page is left intentionally blank.
- Completion of land acquisition and resettlement;
- Developing access to the wayleaves;
- Clearing the wayleaves of buildings and non-compatible vegetation;
- Delivering material to tower sites;
- Installing foundations and erecting towers;
- Stringing and tensioning conductors (wires); and,
- Clean up and restoration.

Work at the Kawanda substation will take place over a period of approximately 30 months. The level of activity in the first year will be most significant, and will consist of site surfacing and other civil works. The electrical installation activities will take place in the second year and will consist of the erection of steel structures and the installation of high voltage equipment, control boards, wiring and control cables. At the peak of construction activity, about 100 workers will be involved in the construction of substation facilities at Kawanda.

Following the completion of construction tests will be undertaken to ensure that the IP performs as per specifications. During testing, line ground clearances will be thoroughly checked. Once the transmission lines are constructed, tested and commissioned relatively little maintenance is required. The key activities involve surveillance of the condition of the transmission line and wayleave; emergency maintenance and repairs; and yearly vegetation control in accordance with UETCL’s existing wayleave clearance programme.
This page is left intentionally blank.
6.0 Public Consultation and Disclosure

6.1 Consultation Program

UETCL, together with BEL, has undertaken extensive consultations as part of the SEA work for the IP and the HPP. Because the projects are closely associated, some of the consultation activities were closely integrated. For example, public meetings held on the west bank of the Nile discussed both the HPP and the IP. Closer to Kampala meetings and consultations tended to focus primarily on the IP. In addition, BEL retained the services of a witness NGO (InterAid Africa) in August 2006 to provide independent monitoring of the consultation activities of the HPP and IP, and to provide a mechanism for stakeholders to file a grievance with the SEA processes.

Overall, the consultation activities and disclosure program has been designed so as to maximise community awareness of the proposed project and SEA study and report and to maximise opportunities for community input and involvement. The approach was designed recognizing that extensive consultations and community engagements were completed by AES Nile Power, and following their withdrawal, ongoing consultations have been carried out by UETCL’s Bujagali Implementation Unit. By all indications, the starting point was a relatively high awareness level of the project; this was confirmed through the initial community consultations undertaken as part of this SEA in August 2006.

The PCDP has built on public consultation procedures carried out in 1999/2001 by the previous project sponsor, AES Nile Power (AESNP), as well as extensive public consultation carried out by the UETCL Bujagali Implementation Unit (BIU) Team since then, particularly in 2004-2005. Similar to the previous public consultations, UETCL has sought to obtain alternative views on the design and construction of the transmission system, including concerns of potential impacts and ways to mitigate such impacts. Based on this input, UETCL has assessed alternatives and considered raised concerns in its decision-making process.

The consultation activities have been organized into six distinct phases, as illustrated on Figure ES-64. The stakeholders that are involved in the consultation activities, and the consultation modalities, are summarized in Table ES1. The consultation program has been designed, and will continue to be implemented, in a manner to ensure participation from women.
<table>
<thead>
<tr>
<th>Public Consultation &amp; Disclosure Activities</th>
<th>Timeline</th>
<th>Project Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I - Initial Stakeholder Consultation</td>
<td>January 2006</td>
<td>Preparation of SEA ToR</td>
</tr>
<tr>
<td>Phase II - Submission of ToR &amp; request for comments</td>
<td>May 2006</td>
<td></td>
</tr>
<tr>
<td>Phase III - Technical Consultation</td>
<td>June 2006</td>
<td></td>
</tr>
<tr>
<td>Phase IV - Action Plans Consultation</td>
<td>September 2006</td>
<td></td>
</tr>
<tr>
<td>Phase VI - Consultation</td>
<td>June 2007</td>
<td>NEMA &amp; International Lenders anticipated SEA approval/acceptance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anticipated financial close; construction start date</td>
</tr>
</tbody>
</table>

**Project Name:** BUJAGALI INTERCONNECTION PROJECT EXECUTIVE SUMMARY

**Prepared for:** UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED

**Date:** December, 2006

**Updated by:** BURNSIDE
This page is left intentionally blank.
Table ES-1: Consultation Activity Summary

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Consultation Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Public</td>
<td>Project notices in national newspapers, web site and making documentation available to all interested parties.</td>
</tr>
<tr>
<td>Government Agencies</td>
<td>Meetings were held with various government agencies and SEA documentation was/is being circulated through NEMA.</td>
</tr>
<tr>
<td>NGOs (national and local)</td>
<td>Numerous NGOs were identified and contacted to arrange meetings with to discuss their concerns and interests. Project documentation was circulated to the NGOs and offers made for additional meetings.</td>
</tr>
<tr>
<td>Local Communities</td>
<td>Contact was made with District and Sub-County level governments to inform them of the project. Sub-County Consultation committees were established and met with to assist in consultation activities with local villages. Public meetings, organised by the Sub-County Community Development Officers were held in the affected communities to advise people of the project and to receive their comments and concerns.</td>
</tr>
<tr>
<td>Project Affected Persons</td>
<td>PAPs include that own property, live and/or are involved in economic activities (typically farming) within the transmission line corridor and associated activities. As part of the RCDAP process, socio-economic surveys were undertaken to establish a profile of the PAPs. It is noted that PAPs within the boundaries of the Kawanda Substation were resettled by the previous project sponsor. An assessment of this past resettlement was undertaken and the results document in the APRAP Report.</td>
</tr>
<tr>
<td>Vulnerable groups</td>
<td>Vulnerable group representatives, including women, were included on the Sub-county Consultation Committees.</td>
</tr>
<tr>
<td>Business Operators</td>
<td>Business operations located within the transmission corridor were identified and profiled as part of the Rap process.</td>
</tr>
<tr>
<td>Tourist/visitors</td>
<td>A section of the transmission project parallels a section of the Nile River and has the potential for visual impacts and could potentially affect tourism activity. Tourist interests were represented through contact with tourist based organisations.</td>
</tr>
<tr>
<td>Cultural Groups</td>
<td>The Kingdom of Buganda was directly consulted with through meetings and the submission of project documentation. These consultations are ongoing.</td>
</tr>
<tr>
<td>Indigenous Peoples</td>
<td>In consultation with WBG specialists, it was determined that no indigenous peoples, as defined for the purposes of World Bank and IFC policies and Performance Standards, were identified to be resident within the project area of influence.</td>
</tr>
</tbody>
</table>

As a result of Phase 1-3 engagement and consultation activities, a number of issues were identified and which were taken into account in the preparation of the SEA. A comprehensive listing of the issues identified and project responses are provided in Table ES-2.
**Table ES-2: Summary of Key Issues and Responses**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue 1: Past resettlement activities</td>
<td>To accommodate the Kawanda substation, residents/tenants were resettled by the previous project sponsor (Nansana village). There has remained some unfilled promises regarding the resettlement. An audit of the past resettlement activities was undertaken and an <em>Assessment of Past Resettlement Action Plan</em> (APRAP) report prepared that outlines the concerns/issues and proposed activities to be undertaken. UETCL has committed to resolve certain of these past resettlement issues in the immediate future and prior to construction initiation. Some actions have already been taken. Consultation on resolving these past problems has been occurring by the BIU and is expected to continue into 2007.</td>
</tr>
<tr>
<td>Issue 2: Land Compensation for the T-line</td>
<td>The key concern relating the IP process is the land/asset valuation process and what people can expect (and when) to receive as compensation. The issue has been complicated by the previous (2001) valuation exercise (see below). As well, along some section of the line, land speculation has occurred which has raised concern regarding the legitimacy of some of the claimed assets on the affected properties. The RCDAP report provides a detailed description of these issues. The Witness BGO (InterAid) became very familiar with this issue.</td>
</tr>
<tr>
<td>Issue 3: Will the previous valuation results be considered?</td>
<td>As noted above, people were initially concerned that the previous valuations would not be honoured and that the new valuation would be lower because some lands have been idle since the original valuation was done (people were told not to improve/use their land by the previous project sponsor after this first valuation was completed). It was explained to them that based on a GoU directive that the original valuation would be honoured (where records are available) so that people would not be worst off with the more recent valuation.</td>
</tr>
<tr>
<td>Issue 4: Will I be compensated for loss of land use over the past 5 years?</td>
<td>As people reported being told by the previous project sponsor to not improve/use their land after the original valuation, some have requested that they be compensated for this loss of land use for the past 5 years. This issue is still being considered as part of the RAP process.</td>
</tr>
<tr>
<td>Issue 5: Community development opportunities/the need to consult</td>
<td>There would appear to be some expectation that the affected communities should receive some benefit from the project in some way (beyond land compensation). UETCL agrees that the local communities should benefit socially and economically from the project. As such, an IP specific RCDAP is to be implemented whereby the communities are to propose projects and make application to UETCL for funding. UETCL will undertake consultations/awareness building exercises with the potentially affected communities prior to construction initiation.</td>
</tr>
</tbody>
</table>
### Issue 6: Construction workforce impacts

The project is expected to attract large numbers of migrants looking for employment opportunities through the project. This influx of people into the area can create challenges in regards to the demand for social services and accommodations. As well, local residents have expressed concerns in regards to the social and health consequences of migrant workers coming into their community.

No specific workers camps are to be created for the IP construction. Instead, workers will be bussed in from the Kampala area of daily basis.

A comprehensive Aids/HIV programme is to be implemented (with the assistance of the Ugandan Aids/HIV NGO TASO or similar organisation) which is to involve education programmes for both the local community and the workers. The hiring practices of the EPC Contractor will be designed so as to minimise people showing up for work on a regular basis.

### Issue 7: Local community access to electricity

Local communities have expressed interest in getting improved access to electricity as a community development initiative. It has been explained to the communities that electrical distribution is the responsibility of UMEME, which is a private company. BEL is committed to work with the communities and UMEME to facilitate improved access to electricity.

### 6.2 Grievance Management Mechanisms

Grievance mechanisms have been included in the Resettlement Action Plan (RAP) studies for this project for both the hydroelectric component and its associated interconnection (transmission) system. They were available during the AESNP sponsorship of the project and were re-instated by UETCL/BEL for the RAP work under the new sponsorship. Going forward, the availability of a Grievance Mechanism will be advertised with the other project notifications regarding the release of the SEA Reports. The advertisements will include the contact information for the Witness NGO (InterAid). A grievance form has been prepared and will be available through the chairpersons of the local villages. The Sub County Committees will also be used to channel the forms and vet the grievance issues. They will identify which ones can be solved locally or one that has to go to higher level beyond the village and Sub-county. Generally, community leaders know the individual PAPs and have the political and social responsibility for the community members. Once a grievance is received, InterAid will investigate the concern and first make a determination of its legitimacy. Assuming the issue to be a valid concern, InterAid will communicate the issue to UETCL and facilitate the process to resolve the issue. Responses and actions (if necessary) to resolve the grievance will be communicated.
to the individual who submitted the grievance. A written record of all grievances received, and how they were dealt with, will be kept by InterAid and UETCL.

6.3 Disclosure Program

In promoting transparency and accountability, UETCL has and will continue to provide relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted. To date, UETCL has disclosed the following documents:

- SEA ToR and the draft PCDP;
- Consultation Summary of the draft findings of the SEA; and,
- HPP SEA Report, which includes APRAP, CDAP, and PCDP.

The SEA ToRs and draft PCDP were distributed in July 2006 to the National government (NEMA) and local government stakeholders (sub-county level). The Consultation Summary Report was released in late September 2006. The final SEA Report was released in December 2006.

The SEA Report and Actions Plans are being made available to the other identified stakeholders and the public at large at publicly accessible locations and on the following web site: www.Bujagali-energy.com.
7.0 Impact Identification, Management and Monitoring

This SEA adopts a project life cycle assessment format. It focuses on the development of specific management initiatives for all phases of the project to ensure that: i) the people closest to the project receive the projected benefits; ii) potentially negative environmental and socio-economic impacts are minimised; and iii) potentially negative health and safety impacts are kept to a minimum. To optimise the life cycle assessment, linkages between potential impacts (i.e., key environmental issues), mitigation measures (i.e. management actions), net effects (i.e. residual effects), and monitoring programmes (i.e. management decision tools) are explicitly made.

This section summarizes:

- Compliance screening of the project against Government of Uganda Legislation, International Treaties and Conventions Ratified by Uganda, and project applicable safeguard policies, performance standards and guidelines;
- Identification and analysis of developmental and community benefits; and,
- Identification and analysis of key project issues, and net effects analysis.

7.1 Compliance Screening

A screening exercise, the details of which are presented in the SEA Report, confirms that the project complies with:

- GoU statues and regulations;
- Relevant international environmental treaties and conventions; and,
- Project applicable standards as determined from the concordance analysis of the social and environmental policies, performance standards and guidelines applicable to the project.

7.2 Developmental and Community Benefits

The project will result in several developmental and community benefits at the national, regional and community levels. These benefits include:

- The project will facilitate interconnection of the Bujagali HPP into the national grid, thereby providing business and people access to much needed power;
- Communities and villages that host the proposed facilities will benefit from access to a Community Development Fund for worthy projects such as upgrades to schools, health centres, and water supply;
- The infrastructure being provided will support transmission needs beyond the IP. Ugandans will benefit through improved system redundancy and potential capacity for future expansion; and,
The regional and local economies will benefit from opportunities for employment and by opportunities to provide goods and services required during construction.

Women will be consulted and benefit (as with men) in the compensation programmes and be prime beneficiaries in the Community Development Action Plan.

7.3 Key Project Issues and Net Effects Analysis

Table ES-3 highlights the key project issues, as well as the corresponding avoidance, protective and mitigative measures relevant to the construction and operational phases of this project.
### Table ES-3: Summary of Impact Mitigation and Effects Monitoring Activities

<table>
<thead>
<tr>
<th>Project Issue</th>
<th>Summary of Mitigation and Net Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resettlement and Land Compensation</td>
<td>At the time of writing the estimated number of affected plots is about 2,485. As different household members within the same household may hold several distinct plots under different land tenure arrangements, this number is higher than the actual number of affected households (about 1,900). This number includes the 120 potentially physically displaced people and the 40 potentially economically displaced people. A Resettlement and Community Development Action Plan has been prepared, the key principles of which are:</td>
</tr>
<tr>
<td></td>
<td>• Resettlement and compensation of Project-Affected People will be carried out in compliance with Ugandan legislation, IFC’s Performance Standard 5 and WB OP 4.12;</td>
</tr>
<tr>
<td></td>
<td>• All physically or economically displaced people will be offered an option between either a full resettlement package, including the provision of replacement residential land and a house, or cash compensation;</td>
</tr>
<tr>
<td></td>
<td>• Past experience in Uganda has shown that cash compensation, although very sought for by many household heads, could be detrimental in the medium term, to other household members, particularly the females and children; the Project will make every effort to promote resettlement rather than cash compensation, and this plan is designed accordingly;</td>
</tr>
<tr>
<td></td>
<td>• Women will be consulted and benefit (with men) and the compensation program – the project is not expected to have any undue impacts on gender</td>
</tr>
<tr>
<td></td>
<td>• A majority of Project-Affected People derive their livelihood from agriculture. Where farmers are physically or economically displaced, they will be offered a resettlement option including the provision of agricultural land of potential equivalent to that of the land they have lost;</td>
</tr>
<tr>
<td></td>
<td>• UETCL will assist PAPs’ in restoring their affected livelihoods, and will provide transitional assistance as necessary as long as livelihoods are not restored to their previous level;</td>
</tr>
<tr>
<td></td>
<td>• The RCDAP implementation and outcomes will be monitored and evaluated as part of a transparent process; and,</td>
</tr>
<tr>
<td></td>
<td>• PAPs and host communities will be informed and consulted during the whole course of RCDAP development, implementation and evaluation.</td>
</tr>
</tbody>
</table>

In addition an Assessment of Past Resettlement and Action Plan has been prepared to ensure those PAPS resettled by the previous project sponsor are no worse off as a result of the project. At Kawanda Substation landowners were either resettled or provided cash compensation for loss of land by the previous project sponsor.
<table>
<thead>
<tr>
<th>Project Issue</th>
<th>Summary of Mitigation and Net Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects on Land and Wildlife</td>
<td>To minimise land-based effects, the EPC Contractor shall site and construct laydown and storage areas, in agreement with the Environmental Manager, who may consult NEMA or other Relevant Authorities for the purpose of agreeing on such a site. Mabira FR will not be used for staging area.</td>
</tr>
<tr>
<td></td>
<td>Various measures will be put in place to minimise topsoil compaction, rutting and soil mixing from construction activities (e.g. use of existing access roads where possible).</td>
</tr>
<tr>
<td></td>
<td>The power lines introduce a potential physical hazard to birds and climbing animals. Risk of electrocution by large climbing animals, such as vervet monkeys, or bats are not expected as the spacing of the conductors and the length of the insulators exceeds the reach of the climbing species and wingspan of bats present in the area.</td>
</tr>
<tr>
<td></td>
<td>The proposed line through the Mabira FR is not located near any significant breeding or staging areas, and therefore bird strikes are not expected to have any significant effects on bird populations in Uganda. Where the transmission line will cross areas that are potentially important as bird flight paths, in particular large wetland bird species, UETCL shall take reasonable measures to make the conductor more conspicuous. These may include the use of reflectors placed at intervals along the conductor. Such measures would be employed, in consultation with the Wetlands Inspection Division and/or National Forest Authority where the line crosses the Lubigi Swamp and where the line crosses the seasonal swamps to the north of Kampala.</td>
</tr>
<tr>
<td>Effects on Water</td>
<td>To reduce the potential for microbial contamination of surface water and soil, a Waste Management Programme will be developed, to include measures such as the provision for on-site treatment of effluent at long term work sites.</td>
</tr>
<tr>
<td></td>
<td>To minimise the deposition of eroded soils into watercourses and disturbance of flows and habitat, towers are to be located outside the top-of-bank of all watercourses; and a vegetated buffer will be maintained along both sides of all watercourse crossings.</td>
</tr>
<tr>
<td></td>
<td>Some towers will be located in and adjacent to the Lubigi Swamp. Special construction techniques will be used to minimize impacts including using large mats for movement of heavy equipment, special procedure for re-fuelling to avoid contamination, and scheduling construction for dry periods. During detailed design taller towers will be considered to enable longer spans and thereby minimize the number of towers in wet areas.</td>
</tr>
</tbody>
</table>
### Project Issue | Summary of Mitigation and Net Effects
---|---
Effects on Air Quality | There exists the potential for dust in the immediate vicinity of construction activities, and along loose surface roadways. A variety of measures to control fugitive dust will be implemented such as the protection of soil stockpiles through wetting and grassing; and the watering of roadways to reduce dust when necessary.

Effects on Noise | To reduce noise levels during construction, a variety of measures will be implemented including restriction of noise-generating activities that take place near residential or sensitive institutional receptors to the period between 0600 and 2200 h, which is defined as ‘daytime’ in the draft Ugandan noise standards.

Access Roads and Traffic | There exists the potential for increased traffic congestion as a result of incremental traffic associated with the project. The Kampala to Jinja highway has a high capacity factor. The estimated day-to-day vehicle requirements will not result in significant change in traffic flows or volume on this road. The occasional movement of abnormal loads to the wayleave, substation sites or storage areas may impede traffic flow on occasion. Procedures will be included in the Traffic Management Plan to ensure transport of abnormal loads is timed and executed to minimise traffic disruption. The selection of local access roads will be made in consultation with local officials to optimise use of roads with adequate capacity.
## Project Issue Summary of Mitigation and Net Effects

### Effects on Managed and Protected Areas

The permanent loss of about 60 ha of forested land will reduce the available habitat for vegetation and wildlife. To reduce effects of the wayleave within Forest Reserves this has been limited to 35 m, versus 40 m in non-forest reserve areas. UETCL has estimated the Total Economic Value of lost forest resource, and will allocate at least equivalent monies to support initiatives by NFA, e.g. enhancement planting, which will compensate for loss of forest resource and associated benefit stream.

After construction, ecological surveys will be undertaken by UETCL to monitor post construction effects.

The resulting cleared corridor may pose a barrier to movement of “forest interior” wildlife species between the forested areas north and south of the route. The 220 kV line through the Mabira Forest Reserve has been routed immediately adjacent to the existing 132 kV line to minimise fragmentation effects. Cross line vegetative corridors between the north and south forested areas will be established by minimising clearing and selective planting of suitable vegetation at select valley locations.

Improvements to access required for construction may have potential to increase grazing, bushmeat hunting and illegal felling of timber. However, access has been improved in recent years, by UETCL upgrading the existing right-of-way through Mabira Forest, including associated bridges and culverts. This has not resulted in significant encroachment. As no significant further upgrades are foreseen, no specific mitigations are necessary.

### Tourism and Aesthetics

Presence of the line reduces aesthetic values for ecotourism and recreation in managed and protected areas. No existing or planned tourism facilities are will be directly affected.

Concern was raised during consultations about the visual impact of the lines from vistas along the east bank of the Nile. UETCL is prepared a detailed visual analysis for that portion of the route, and is investigating opportunities to adjust the route to minimise visibility from key vistas.
<table>
<thead>
<tr>
<th>Project Issue</th>
<th>Summary of Mitigation and Net Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects on Cultural Property</td>
<td>No major archaeological sites have been identified in the areas affected by the IP. As part of the SEA, an archaeological survey has been completed for the Kawanda substation. Prior to construction, the sites for the towers will be surveyed by an archaeologist. Should any sites be identified, including graves, mitigation measures are to be agreed upon by the Department of Antiquities, the local community and UETCL. Discussions are ongoing with the Buganda Kingdom. Should any sites of spiritual significance be identified, the Kingdom will be consulted to determine the most appropriate means to address/mitigate impacts on these sites. The transmission corridor may pass over small structures used by the residents for offerings to spirits (known as Amasabo). The location of these sites is to be determined through the ongoing socio-economic surveys. It is possible to relocate amasabo subject to certain ceremonies.</td>
</tr>
</tbody>
</table>
| Community, Health, Safety and Security | Appropriate measures will be put in place to reduce risk to public safety including: accidental contact with lines, collision with construction equipment, excavations on ROW, material storage, tower construction. To reduce risk of accidents due to project related traffic, UETCL and the EPC Contractor will prepare and implement a Traffic Management Plan (TMP) that contains appropriate strategies for: moving materials, equipment and workers to and from the site, including abnormal loads; and, management of connection points between access roads and main public highways. To reduce risk to students and staff of Kawanda Secondary School, as part of upgrading the access road, UETCL will erect a barrier to separate vehicles and pedestrian traffic. UETCL to post and abide by speed limits on this access road. The EPC Contractor will provide a manned crossing at the beginning and end of the school day, if required UETCL will make a presentation to school staff and students about traffic safety and project scheduling. To reduce the risk of environmental contamination from spillage or disposal of fuels, lubricants, oils and solvents on the construction site, UETCL and the EPC Contractor shall dispose of materials defined as hazardous waste (e.g. hydraulic oil) in a responsible way, and where reasonable, shall return such materials to the manufacturer for recycling. There will be no permanent construction camp(s) associated with the IP that might attract camp followers. Workers will be bussed from urban areas to the work site. The EPC Contractor will, as part of each worker's initial
<table>
<thead>
<tr>
<th>Project Issue</th>
<th>Summary of Mitigation and Net Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation and ongoing education, provide public education information about HIV/AIDS transmission and preventative measures. Condoms will be made available to project workers at no cost. Thus the spread of AIDS/HIV and other STDs are not expected to increase disproportionately as a result of the IP.</td>
<td></td>
</tr>
<tr>
<td>There is often concern regarding the health effects of Electro-Magnetic Fields (EMF) from high voltage transmission lines. Available laboratory or human data have not demonstrated what, if any, magnitudes of power-line electric and magnetic fields cause human health effects. The electrical transmission line will be designed and constructed to ensure that EMF levels are below the International Commission on Non-Ionising Radiation Protection’s Guidelines. No adverse effects on human health and welfare can be expected from operation of the proposed facilities, either on the basis of EMF guidelines, or on the basis of conclusions reached by scientific review groups that have examined EMF studies reported in the scientific literature.</td>
<td></td>
</tr>
<tr>
<td>Labour and Working Conditions</td>
<td>EPC contractor will implement a Labour Force Management Plan that includes policies and procedures on:</td>
</tr>
<tr>
<td></td>
<td>- Human resources policy and information provision to workers</td>
</tr>
<tr>
<td></td>
<td>- Respect for collective agreements and provision of reasonable working conditions and terms of employment</td>
</tr>
<tr>
<td></td>
<td>- Freedom of association and collective bargaining</td>
</tr>
<tr>
<td></td>
<td>- Non-discrimination and equal opportunity</td>
</tr>
<tr>
<td></td>
<td>- Retrenchment</td>
</tr>
<tr>
<td></td>
<td>- Grievance mechanisms</td>
</tr>
<tr>
<td></td>
<td>- Child labour and forced labour</td>
</tr>
<tr>
<td></td>
<td>- Health and safety</td>
</tr>
<tr>
<td></td>
<td>- Non-employee workers</td>
</tr>
<tr>
<td></td>
<td>- Supply chains</td>
</tr>
<tr>
<td>Cumulative Effects</td>
<td>UETCL has avoided potentially significant cumulative social effects by routing the 220 kV line to the Kawanda substation, rather than to the existing Kampala North substation. In Forest Reserve Lands, the normal 40 wayleave width will be restricted to 35 m to reduce cumulative effect of the clearing needed for the wayleaves – at select locations wildlife corridors will be maintained across the wayleaves.</td>
</tr>
<tr>
<td></td>
<td>UETCL is working with the National Forestry Agency on the details of mitigation and monetary compensation for loss of trees and associated forestry, ecological and tourism uses.</td>
</tr>
<tr>
<td></td>
<td>The enhanced capacity of building a 220 kV capacity line now avoids the need for construction of an additional line in future as loads and transmission demands grow.</td>
</tr>
</tbody>
</table>
8.0 Social and Environmental Action Plan

The SEA provides a framework for the Social and Environmental Action Plan (SEAP) that will be developed for the project. At the time the SEA was written, certain detailed planning and design activities relevant to the SEAP were still to be completed. Thus, the SEAP is described at the level of detail available at the time of writing. When the detailed activities are completed, they will be integrated within the framework of the SEAP and an update will be prepared and released by BEL. Currently, the SEAP framework addresses the following key components:

- Social and environmental management policies and systems;
- Mitigation plans, procedures, and programmes;
- Monitoring activities;
- Implementation schedules and cost estimates; and,
- Plans for integrating the SEAP within the overall development plan for the project.

8.1 Environmental Management

UETCL is the project sponsor and will have overall responsibility for the design and building of the interconnection system and will be responsible for the operation of the system, and for implementing environmental and social management measures associated with operation of the transmission system.

As project sponsor, the ultimate responsibility for the project’s compliance with Ugandan and international lender legislation and guidelines for environmental and social performance will lie with UETCL. However, UETCL has retained BEL as its Authorised Agent, and as such BEL will be responsible for managing the environmental permitting and construction phases of the interconnection project.

Both UETCL and BEL are committed to executing their respective responsibilities in an environmentally responsible manner and in compliance with all applicable environmental laws, regulations, and guidelines.

A contractor, will construct the transmission system on a turnkey Engineer, Procure and Construct (EPC) basis. This contractor is referred to as “the EPC Contractor” in the remainder of this document. For the most part day-to-day responsibility for implementing environmental and social mitigation, compensation and monitoring actions related to construction will in many cases be devolved to the EPC Contractor or to third parties.

The SEAP addresses both the construction and operational phases of the hydropower facility for a 30 year period, until UEGCL, or its successor, assumes ownership and responsibility of the hydropower facility.
UETCL and BEL is committed to the creation and implementation of programmes to reduce the probability of occurrence of deleterious environmental incidents. Contingency plans will be developed for dealing with such adverse incidents, if they occur.

UETCL and BEL will expect the same level of environmental performance from its agents, suppliers, and sub-contractors and will stipulate this in any legally binding agreements it enters with these parties.

8.2 Relationship of the SEAP to other Project Plans

The SEAP is an umbrella plan that is comprised of several components that are to be integrated and implemented by UETCL and its contractors with regard to the IP. These components are shown in Figure ES-57.

While this SEA includes working versions of three of the Sponsor’s Action Plans (namely the PCDP, the APRAP and the RCDAP), those which are the responsibility of the EPC Contractor, and those of the sponsor not included herein will be developed after the EPC Contractor has been appointed at the appropriate level of detail for that stage of project development. The overall objective is to have final versions ready as needed for their implementation. Consultations and disclosure of the various plans will occur throughout the process of their development and implementation.

8.3 Implementation of the Social and Environmental Action Plan

8.3.1 EPC Contractor’s Commitments and Resourcing

The EPC Contractor will designate an appropriately experienced and qualified Site Environmental Officer (SEO), who will be responsible for implementation of the measures set out in the Contractor’s EMMP.

The Environmental Field Inspectors will be appointed during the mobilisation phase, and will be local staff with relevant environmental/engineering experience, who are fluent in local languages. The number of field inspectors may be adjusted according to the environmental issues on-site.

The SEO will have overall responsibility for the activities of the Contractor’s Environmental department. On a day-to-day basis the emphasis of his work will be upon liaison with BEL’s Environmental Manager, and with relevant authorities, local residents and NGOs on environmental issues (i.e. external liaison). The responsibility for day-to-day management of the field team will be devolved to the Environmental Field Co-ordinator. The field team will comprise Field Inspectors, supported by drivers and labourers. The Field Inspectors will maintain a permanent presence on-
Social & Environmental Action Plan (SEAP)

Sponsor's Action Plan

- Public Consultation and Disclosure Plan (PCDP)
- Assessment of Past Resettlement Activities and Action Plan (APRAP)
- Resettlement and Community Development Action Plan (RCDAP)
- Labour Force Management Plan (LFMP)
- Environmental Mitigation & Monitoring Plan (EMMP)

Contractor's Action Plan

- Traffic/Access Management Plan (TMP)
- Waste Management Plan (WMP)
- Labour Force Management Plan (LFMP)
- Environmental Mitigation & Monitoring Plan (EMMP)
- Health & Safety Management Plan (HSMP)
- Pollutant Spill Contingency Plan (PSCP)
- Hazardous Materials Management Programme (HMMP)

Project Name: BUIJAGALI INTERCONNECTION
Date: December, 2006
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED

Figure ES-7

SEAP COMPONENT PLANS
This page is left intentionally blank.
site, carrying out routine checks of operating procedures and environmental monitoring.

8.3.2 Reporting Lines and Decision-Making

On a quarterly basis, the SEO will provide the Environmental Manager with a report containing monitoring results (and a summary of these), a synopsis of environmental issues encountered, and the efficacy of solutions to these issues. The Environmental Manager will use these as the basis for UETCL's quarterly environmental reports. UETCL's quarterly reports will also include commentary on the implementation and efficacy of environmental mitigation actions implemented by UETCL.

The Environmental Manager will develop annual environmental reports suitable for submission to NEMA (as a requirement of the Ugandan Environmental Impact Assessment Regulations) and to other stakeholders as appropriate. This will provide an opportunity for NEMA and stakeholders to comment both on the impacts of the project itself and the efficacy of the SEAP. Where necessary, the SEAP will be updated.

8.3.3 Social and Environmental Auditing and Reporting

Auditing of the environmental compliance of the project will be carried out at two levels: internal and external.

UETCL will specify procedures for annual internal audits as part of the SEAP, and any other environmental requirements, such as those imposed by NEMA and/or the international lenders. The responsibility for implementing these audits will lie with the Environmental Manager, who may elect to employ external Consultants.

External audits of EPC Contractor's environmental compliance will be carried out by UETCL, and potentially by representatives of NEMA and the World Bank/IDA.

It is a requirement of NEMA and the lenders that annual environmental reports ("self-auditing") be submitted for review. The Environmental Manager will be responsible for compiling and submitting these reports, and will consult with NEMA to determine any additional mitigation measures or monitoring that is considered to be required. Self-audit reports will be compiled from internal and external audits carried out by both UETCL and EPC Contractor. It should be noted that the EIA Regulations require the names and qualifications of persons carrying out "self-auditing" to be approved by the Executive Director of NEMA. Therefore the Environmental Manager and the SEO will have to be approved by NEMA before official appointment.
8.3.4 Change Management

During the implementation of the project, change may be required to address unforeseen or unexpected conditions or situations. A change management process will be applied to ensure environmental and social issues are addressed as part of any significant changes to project procedures, processes, design or activities. Both UETCL and the EPC Contractor will be responsible for managing changes within their respective areas of responsibility.

8.4 Responsibilities for Social and Environmental Mitigation Measures

Table ES-4 below outlines the overall package of environmental mitigation measures that will be implemented in relation to the Bujagali interconnection system. The table also assigns general responsibilities for implementing each group of mitigation measures, and provide budget estimates and locations for each. A detailed implementation schedule will be developed once the EPC Contractor is selected and further detailed planning is completed.

Consistent with the Bujagali Project’s contracting strategy of integrating environmental protection and mitigation activities into the EPC Contractor’s Scope of Work, the specifications for many of the activities will be included in the bid package upon which the EPC Contractor will develop its base rates.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Action/s</th>
<th>Timing</th>
<th>Responsibility</th>
<th>Estimated Cost (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staffing for SEAP Implementation</td>
<td>Recruit SEAP Implementation Team</td>
<td>Months 1-3 after Financial Close</td>
<td>UETCL - Implementation Manager</td>
<td>250,000</td>
</tr>
<tr>
<td>Resettlement Corrective Actions</td>
<td>Implement APRAP</td>
<td>Year 1 after Financial Close</td>
<td>UETCL - Social Unit</td>
<td>40,000</td>
</tr>
<tr>
<td>Community Development</td>
<td>Implement RCDAP</td>
<td>Preconstruction</td>
<td>UETCL - Social Unit</td>
<td>300,000</td>
</tr>
<tr>
<td>Land Acquisition and Resettlement</td>
<td>Implement RCDAP</td>
<td>Preconstruction</td>
<td>UETCL - Social Unit</td>
<td>16,643,663</td>
</tr>
<tr>
<td>Public Consultation/Community Liaison</td>
<td>Implement PCDP</td>
<td>Throughout Construction Phase</td>
<td>UETCL - Community Liaison Manager</td>
<td>Included in salary for SEAP implementation team</td>
</tr>
<tr>
<td>Labour Force Management</td>
<td>Develop Sponsor’s LFMP</td>
<td>Months 1-3 after Financial Close</td>
<td>UETCL - H&amp;S/HR Managers</td>
<td>20,000</td>
</tr>
<tr>
<td>Labour Force Management</td>
<td>Develop EPC Contractor’s LFMP</td>
<td>Months 1-3 after appointment</td>
<td>EPC Contractor</td>
<td>Within EPC contract price</td>
</tr>
<tr>
<td>Mitigation of biophysical impacts - not construction-</td>
<td>Implement Sponsor’s EMMP</td>
<td>Preconstruction</td>
<td>UETCL (Environmental Manager)</td>
<td>150,000</td>
</tr>
</tbody>
</table>
### Issue | Action/s | Timing | Responsibility | Estimated Cost (USD)
---|---|---|---|---
related | | Construction Phase | UETCL (Environmental Manager) | 25,000
| | Operations Phase (first 2 years) | UETCL (Environmental Manager) | Within above salaries
Mitigation of biophysical impacts -construction-related | Implement Contractor’s EMMP | Throughout Construction Phase | EPC Contractor (SEO) | Within EPC contract price

#### 8.5 Responsibilities for Environmental Monitoring Measures

The SEAP outlines the overall package of environmental monitoring that will be carried out in relation to the Bujagali IP. The SEAP also assigns responsibilities for each monitoring activity, and proposes parties who are capable of carrying out the monitoring, on behalf of the responsible body.

It should be noted that, consistent with the strategy of integrating social and environmental protection and mitigation activities into the EPC Contractor’s Scope of Work, the specifications for many of the construction-related monitoring activities were included in the bid package upon which the EPC Contractor is developing its base rates. Therefore it is not possible to present a detailed accounting of all the monies devoted to the project’s environmental monitoring activities during the construction phase.